

A PROCESS AND SYSTEM FOR PRODUCING, WHEN CALLING A  
STANDARD PORTABLE MOBILE TELEPHONE, AN ACOUSTIC SIGNAL  
OF POWER COMPARABLE TO THAT OF THE RING OF A DOMESTIC  
TELEPHONE INSTRUMENT

The present invention concerns a process and a system for producing, when calling a standard portable mobile telephone, an acoustic signal of power comparable to that of the ring of a domestic telephone instrument.

By "acoustic signal of power comparable to that of the ring of a domestic telephone instrument", is understood an acoustic signal which may be heard from most if not all of the rooms of domestic premises or of premises of the same size comprising several offices.

The inventors have noticed that mobile telephones are community telephones which, by their very construction, are designed to disturb their environment as little as possible. Thus, their sound power, particularly that of the call ring is intentionally reduced such that in practice, only the carrier of the mobile telephone is in a position to hear the acoustic signal emitted. Indeed, the ring of portable telephones is by nature low in power, their compactness does not allow large-capacity electrical power sources to be fitted. The ring cannot be heard if the user is not close at hand, or if the sound environment is congested. Additionally, it may be that in some parts of the premises, the network is not picked up, whereas in other places on the same premises, the network is present. The place where the portable telephone is to

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be put down depends on network reception quality. This place is not necessarily where the user wishes to be. Furthermore and above all, the development of the mobile phone culture is driving industrialists to develop ever lighter, ever more compact, ever more distinctive, ever more confidential, in short ever more personal mobiles. The portable telephone is kept close to the individual. Its ring may therefore only be heard in a small range area around the place where that individual happens to be. Some mobiles with vibrators could even dispense with emitting a ring. Acknowledging this has not deterred the inventors from their plan. They have imagined that a portable mobile telephone might constitute a secondary telephone, if not the main telephone, in places where the mobile telephone subscriber is not bound by sound constraints in respect of the environment, for example, a second home. In other words, the inventors have set themselves the problem of converting the portable mobile telephone into a fixed telephone whose call ring could be heard from all the rooms in the place where the mobile telephone subscriber happens to be.

Thus, insofar as this problem can be solved, it would no longer be necessary for the subscriber to carry the mobile telephone permanently on his/her person in places where he/she is staying for some time. Moreover, he/she would then be able to set down the mobile telephone in the area of the premises where the GSM reception is best.

The inventors are aware that there is already an installed base of mobile telephones and that it is

rather unlikely that the manufacturers of mobile telephones will call in and modify equipment already sold.

It is accepted that manufacturers must comply with standards. Some time will be needed for new standards to be drawn up and for mobile telephones to be designed which are able to be used in two different ways:

- on the one hand, in a discreet way in places where the noise pollution they create might disturb the environment,

- on the other hand, in an habitual way like a fixed telephone, at the discretion of the user.

The manufacture of low cost, low weight, high energy batteries to power call rings with high acoustic power is a complex technological problem to solve.

The inventors have therefore ruled out technical solutions consisting in modifying the mobile telephone itself or some of its constituent parts.

The document: EP 0423 773 A (SIEMENS AG OSTERREICH; SIEMENS AG (DE)) describes exactly the technical solution set aside by the inventors. This document describes a system combining:

- a mobile telephone (MT) in which is incorporated a mobile coupling device (MKE) and  
- a base (AV) comprising a fixed coupling device (SKE) with the mobile coupling device (MKE).

The base contains an additional, relatively powerful ring. The coupling device (MKE) contains a multi-pole plug-in socket for data and speech transfers. Thus, it is clear that the mobile telephone

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(MT) is designed and contains adapted parts so as to engage with the base (AV).

The implementation of a technical solution such as that described in the document cited would entail the modification of the mobile telephones already sold. It would also entail the adoption by the manufacturers of new standards and the manufacture of mobile telephones specifically adapted to engage with the bases containing the additional power rings.

The document cited does not relate to the problem posed and solved by the present invention. It does not describe a solution which can be adapted to a pre-existent mobile telephone base.

The process according to the invention makes it possible, when calling a standard portable mobile telephone from a calling station, to produce an acoustic signal of power comparable to that of the ring of a domestic telephone instrument.

The process according to the invention includes the stages:

- of autonomous detection by the mobile telephone, directly or indirectly, of the call from the calling station and of generation of a detection signal, then
- of triggering, by means of said detection signal, the emission of an acoustic signal of power comparable to that of the ring of a domestic telephone instrument.

Thus, the user of the standard mobile telephone is alerted to the incoming call even if he/she happens to be some distance away from the standard mobile telephone.

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Preferably, the process according to the invention additionally includes the stage of emitting the acoustic signal by means of an emitter supplied, directly or indirectly, with power by a domestic source, particularly by a charger connected to the household electricity and/or a rechargeable battery by a charger connected to the household electricity.

Thus, the number of incoming calls giving rise to the production of a high power acoustic signal is not limited by the capacity of the power source.

Advantageously, according to a first embodiment variant, for the mobile telephone to detect autonomously the call from the calling station, a disturbance of the electromagnetic environment of the mobile telephone is detected.

Advantageously, according to a second embodiment variant, where in sleep mode the mobile telephone is combined with a charger, for the mobile telephone to detect autonomously the call from the calling station, the variations in charging current of said charger are detected.

Advantageously, according to a third embodiment variant, where the mobile telephone comprises a vibrator intended to signal calls to the user, for the mobile telephone to detect autonomously the call from the calling station, vibrations given out by said vibrator are detected. It would also be possible to detect acoustic vibrations created by the ring of the mobile telephone when the calling station calls.

Advantageously, according to a fourth embodiment variant, for the mobile telephone to detect

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autonomously the call from the calling station, the call emitted by the calling station is detected by means of an independent electronic circuit.

Thus, whatever the embodiment variant considered,  
5 it is not necessary to modify the electronic circuits of the standard mobile telephone.

The invention also concerns a device for producing, when calling a standard portable mobile telephone from a calling station, an acoustic signal of  
10 power comparable to that of the ring of a domestic telephone instrument.

The device according to the invention includes:

- detection means for the mobile telephone to detect, directly or indirectly, the call from the  
15 calling station and,
- detection signal production means.

The device according to the invention also includes means for triggering, by means of said detection signal, the emission by an acoustic emitter  
20 of an acoustic signal of power comparable to that of the ring of a domestic telephone instrument.

Thus, the user is alerted to the incoming call even if he/she happens to be some distance away from the standard mobile telephone. The device according to  
25 the invention allows the mobile to be separated from its user without the latter losing thereby the possibility of benefiting from its calls. More widely, it allows the mobile to recover the domestic or social user-friendliness which characterises the qualities of  
30 any fixed installation telephone. Moreover the device according to the invention makes it possible to hear

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the mobile in a large part of the premises, even if only some sectors of these premises are covered by the network.

Preferably, said acoustic emitter is supplied,  
5 directly or indirectly, with electric power by a domestic source, particularly by a charger connected to the household electricity and/or a rechargeable battery by a charger connected to the household electricity.

Thus, the number of incoming calls giving rise to  
10 the production of a high power acoustic signal is not limited by the capacity of the power source.

Advantageously, according to a first embodiment variant, the detection means for the mobile telephone to detect autonomously the call from the calling  
15 station comprise disturbance analysis means of the electromagnetic fields surrounding the mobile telephone.

Advantageously, according to a second embodiment variant, where the mobile telephone is combined in  
20 sleep mode with a charger, the detection means for the mobile telephone to detect autonomously the call from the calling station comprise analysis means of the charging current of said charger.

Advantageously, according to a third embodiment  
25 variant, where the mobile telephone comprises a vibrator intended to signal the calls to the user, the detection means for the mobile telephone to detect autonomously the call from the calling station include receivers sensitive to the vibrations given out by said  
30 vibrator. Analysis means could also be implemented combined with "voice" recognition means for detecting

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and recognising the acoustic vibration created by the ring of the mobile telephone when the calling station calls.

Advantageously, according to a fourth embodiment  
5 variant, the detection means for the mobile telephone to detect autonomously the call from the calling station comprise an independent electronic circuit picking up the call signals emitted by the calling station.

10 Thus, whatever the embodiment variant considered, it is not necessary to modify the electronic circuits of the standard mobile telephone.

Some embodiment variants will now be described in more detail.

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I. The case of disturbance in the electromagnetic field.

When the portable mobile telephone receives a call from the calling station, its electromagnetic  
20 environment is disturbed by the electromagnetic wave received and/or by the fields created by the currents circulating in the electronic circuits of the mobile telephone detecting the electromagnetic wave received and responding back.

25 By detecting this disturbance in the electromagnetic environment created by the incoming call, it is possible to activate a powerful ring after analysing and amplifying the signals detected.

30 II. The case where the mobile telephone is combined in sleep mode with a charger.

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When the mobile is in sleep mode and being charged from the household electricity and when the mobile is called, at that exact moment there occurs a drop in electric current in the recharge circuit of the batteries of the mobile, and in a part of the components contained in the mobile itself.

The device according to the invention makes it possible to pick up, thanks to a detector, this modification of the electric current, and to apply it to an amplifier generating acoustic waves conveying a powerful ring that may be modulated as required.

This device composed of a ring-generating amplifier detector may be placed in an appropriate location, chosen from among the following configurations:

- the device may be integrated into the charger itself which usually contains the transformer and the current rectifier,
- the device may be inserted into the load circuitry of the batteries,
- the device may be contained in a support unit of the mobile,
- the device may be separated from the mobile charger unit and connected by conductors to one of the aforementioned components.

### III. The case where the portable mobile telephone comprises a vibrator.

In the event of the portable mobile telephone comprising a vibrator, the device according to the invention comprises an electronic vibration detector 1.

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This detector supplies a digital or analogue signal corresponding to the vibrations it detects.

The device additionally comprises data processing means 2 responsible for analysing the signal supplied by the vibration detector so as to determine if these vibrations come from the mobile and, if so, to generate a ring tone. The device may also be fitted with an external device (switches or links) allowing a ring tone to be selected.

The device also comprises an amplifier 3 connected to the data processing means. This amplifier is responsible for amplifying the ring tone generated by the data processing means. It may also be fitted with a potentiometer enabling the sound level of the tone to be adjusted.

A loudspeaker 4, connected to the amplifier, enables the ring to be played back.

A power supply 5 supplies the electrical power (voltage) necessary for each part of the system. This power may be supplied by a mains block, by cell batteries, or by rechargeable batteries. The power supply comprises an on/off button and an operation pilot indicator.

The device comes in the form of a flat casing on which the mobile rests.

A comparable device may be implemented to detect the acoustic vibration emitted by the ring of the mobile telephone, to analyse it and recognise by voice recognition technology the origin of this acoustic vibration. The device may then emit, as has been

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described above, a powerful ring intended for the user located some distance away.

#### IV. The case of an independent electronic circuit

5       The device may be physically separate, portable, and not connected to the mobile charger unit. In this case, the device is composed of a receiver part, which is light and compact, comparable to that of the mobile, and of a part generating a powerful ring. This  
10 independent device, powered by rechargeable batteries, is in connection with the emitter, just like the mobile, by electromagnetic waves. The device has been initialised during commissioning, exactly like the mobile. When the mobile is called, whether or not it is  
15 in sleep mode, the receiver part of the device is acted upon and controls the ring generator which rings. This ring stops when the communication is taken on the mobile, or when the call stops, or when the mobile's voice message system is engaged.

20       The user may as required move some distance away from the mobile and be alerted to any call, without needing to carry the mobile around. In this way other persons may use it. If necessary, as many independent devices as desired can be used.

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